

Application No. 10/584,694
Amendment Dated: October 19, 2011
Reply to Office Action Dated July 20, 2011

Amendments to the Claims:

This listing of claims will replace all prior versions and listings of claims in the application:

Listing of Claims:

1. (currently amended) A fixed caliper for a disc-brake comprising two side walls at a distance from each other which delimit space suitable to accommodate a portion of a brake disc, in which one of said side walls comprises means for attaching the caliper to a vehicle so that said caliper is integral in rotation and in translation and the side walls are connected to each other by means of a connecting structure which straddles the disc space, in which each of said side walls delimits at least one seating capable of accommodating at least one pad and in which the caliper comprises thrust means capable of forcing the pads against the brake disc to clamp the pads, said thrust means being secured to said side walls in such a way that said side walls absorb the entire clamping force and said seatings being capable of securing the pads in such a way that the side walls also absorb the entire braking force applicable by the pads to the brake disc by friction, in which said connecting structure comprises one or more shells, arc-shaped or arranged along an arc, ~~connected so as to be~~ formed as a single integral structure having with both side walls along outer circumferential edges thereof, in which the slenderness of said one or more shells expressed as the ratio of thickness to circumferential extension of said one or more shells relative to an axis of rotation of the brake disc is less than 17/100, wherein the radial thickness of all shells forming said connecting structure is constant along the entire circumferential extension of

said connecting structure; and

wherein said one or more shells delimit one or more through openings, in which the total area of opening of said through openings is less than 40% of the total area of the one or more shells including that of said through openings in which the slenderness of the entire connecting structure formed by said one or more shells, including the through openings, expressed as the ratio of thickness to circumferential extension of said entire connecting structure relative to the axis of rotation of the brake disc is between 2/100 and 4/100.

2. (cancelled)

3. (previously presented) A fixed caliper according to claim 1, in which said total area of opening of the through openings is between 15% to 25% of the total area of the one or more shells including that of the through openings.

4. (cancelled)

5. (previously presented) A fixed caliper according to claim 1, in which the slenderness of each of said one or more shells, expressed as the ratio of thickness to extension of the shell between said through openings in a circumferential direction relative to the axis of rotation of the brake disc is between 5/100 and 17/100.

6. (currently amended) A fixed caliper for a disc-brake comprising two side walls at a distance from each other which delimit a space suitable to accommodate a portion of a brake disc, in which one of said side walls comprises means for attaching the caliper to a vehicle so that said caliper is integral in rotation and in translation and the side walls are connected to each other by means of a connecting structure which straddles the disc space, in which each of said side walls delimits at least one seating capable of accommodating at least one pad and in which the caliper comprises thrust means capable of forcing the pads against the brake disc to clamp the pads, said thrust means being secured to said side walls in such a way that said side walls absorb the entire clamping force and said seatings being capable of securing the pads in such a way that the side walls also absorb the entire braking force applicable by the pads to the brake disc by friction, in which said connecting structure comprises one or more shells, arc-shaped or arranged along an arc, ~~connected so as to be~~ formed as a single integral structure having with both side walls along outer circumferential edges thereof, in which the slenderness of said one or more shells expressed as the ratio of thickness to circumferential extension of said one or more shells relative to an axis of rotation of the brake disc is less than 17/100, wherein the radial thickness of all shells forming said connecting structure is constant along the entire circumferential extension of said connecting structure; and

wherein said connecting structure extends substantially along an arc of circle having a radius of 180 mm to 220 mm, in which the average thickness of the shell is between 5 mm and 15 mm, and wherein the circumferential extension of said connecting structure corresponds to an angle of aperture of a sector of circle of between 100° and 130°.

7-8. (cancelled)

9. (previously presented) A fixed caliper according to claim 6, in which the slenderness of the one or more shells in the area of the seatings for the pads, expressed as the ratio of thickness to axial extension relative to the axis of rotation of the brake disc is between $5/35$ and $7/35$.

10. (previously presented) A fixed caliper according to claim 6, in which the slenderness of the one or more shells in the areas of the walls outside the seatings for the pads, expressed as the ratio of thickness to axial extension relative to the axis of rotation of the brake disc is between $2/7$ and $5/7$.

11. (previously presented) A fixed caliper according to claim 6, in which the thickness of said one or more shells is substantially constant along the entire circumferential extension of the connecting structure.

12. (previously presented) A fixed caliper according to claim 6, in which the thickness of said one or more shells is substantially constant along the entire axial extension of the connecting structure.

13. (previously presented) A fixed caliper according to claim 6, in which said one or more shells is made in one piece with said side walls.

14. (previously presented) A fixed caliper according to claim 6, in which said connecting structure comprises a single shell which delimits at least one substantially circular through opening.

15. (previously presented) A fixed caliper according to claim 14, in which said single shell delimits three openings, substantially circular and equidistant from each other in a circumferential direction relative to the axis of rotation of the disc, and also arranged halfway between the two side walls.

16. (previously presented) A fixed caliper according to claim 15, in which said three openings are arranged substantially in the area of the caliper in which the seatings for the pads are located.

17. (previously presented) A fixed caliper according to claim 6, in which said connecting structure comprises:

- two outer shells arranged at two opposite ends of the caliper, viewed in a circumferential direction of the brake disc, which connect respective ends of the side walls;
- a central shell arranged approximately halfway between said outer shells which

connects the side walls in the area of the seatings for the pads,

in which the connecting structure delimits between said central shell and each of said outer shells, a through opening having a circumferential extension less than the circumferential extension of the adjacent shells.

18. (previously presented) A fixed caliper according to claim 17, in which the circumferential extension of each of said through openings is less than or equal to half the circumferential extension of each of the adjacent shells.

19. (previously presented) A fixed caliper according to claim 17, in which said through openings are substantially rectangular.

20. (previously presented) A fixed caliper according to claim 19, in which the central shell delimits a further through opening arranged approximately at the centre of the central shell, said further through opening having a circumferential extension less than that of each of the portions of the central shell adjacent to said further through opening.

21. (currently amended) A fixed caliper for a disc-brake comprising two side walls at a distance from each other which delimit a space suitable to accommodate a portion of a brake disc, in which one of said side walls comprises means for attaching the caliper to a vehicle so that said caliper is integral in rotation and in translation and the side walls are connected to each

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other by means of a connecting structure which straddles the disc space, in which each of said side walls delimits at least one seating capable of accommodating at least one pad and in which the caliper comprises thrust means capable of forcing the pads against the brake disc to clamp the pads, said thrust means being secured to said side walls in such a way that said side walls absorb the entire clamping force and said seatings being capable of securing the pads in such a way that the side walls also absorb the entire braking force applicable by the pads to the brake disc by friction, in which said connecting structure comprises one or more shells, arc-shaped or arranged along an arc, ~~connected so as to be~~ formed as a single integral structure having with both side walls along outer circumferential edges thereof, in which the slenderness of said one or more shells expressed as the ratio of thickness to circumferential extension of said one or more shells relative to an axis of rotation of the brake disc is less than $17/100$, wherein the radial thickness of all shells forming said connecting structure is constant along the entire circumferential extension of said connecting structure;

wherein the circumferential extension of at least one of said shells is at least double its axial extension relative to the axis of rotation of the disc; and

wherein said one or more shells delimit one or more through openings, in which the total area of opening of said through openings is less than 40% of the total area of the one or more shells including that of said through openings in which the slenderness of the entire connecting structure formed by said one or more shells, including the through openings, expressed as the ratio of thickness to circumferential extension of said entire connecting structure relative to the axis of rotation of the brake disc is between $2/100$ and $4/100$.

22. (previously presented) A fixed caliper according to claim 21, in which said one or more shells have a double curvature, concave viewed from the disc space, forming a first arc which extends transversely to a plane of the brake disc and a second arc which lies in said plane of the brake disc.

23. (previously presented) A fixed caliper according to claim 21, in which on the radially outer side of at least one of said shells a groove is made, capable of accommodating a pipe for fluid to pass between hydraulic cylinders arranged in the two side walls and embodying said thrust means.

24. (previously presented) A fixed caliper according to claim 21, in which each of the two side walls delimits three seatings for hydraulic cylinder/piston units which embody said thrust means, said three seatings being arranged on different circumferences relative to the axis of rotation of the brake disc.

25. (previously presented) A fixed caliper according to claim 24, in which said three seatings are arranged on circumferences with a radius decreasing in the direction of movement of the brake disc corresponding to forward travel of the vehicle.

26. (currently amended) A disc-brake having a fixed caliper comprising two side walls at

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a distance from each other which delimit a space suitable to accommodate a portion of a brake disc, in which one of said side walls comprises means for attaching the caliper to a vehicle so that said caliper is integral in rotation and in translation and the side walls are connected to each other by means of a connecting structure which straddles the disc space, in which each of said side walls delimits at least one seating capable of accommodating at least one pad and in which the caliper comprises thrust means capable of forcing the pads against the brake disc to clamp the pads, said thrust means being secured to said side walls in such a way that said side walls absorb the entire clamping force and said seatings being capable of securing the pads in such a way that the side walls also absorb the entire braking force applicable by the pads to the brake disc by friction, in which said connecting structure comprises one or more shells, arc-shaped or arranged along an arc, ~~connected so as to be~~ formed as a single integral structure having with both side walls along outer circumferential edges thereof, in which the slenderness of said one or more shells expressed as the ratio of thickness to circumferential extension of said one or more shells relative to an axis of rotation of the brake disc is less than 17/100, wherein the radial thickness of all shells forming said connecting structure is constant along the entire circumferential extension of said connecting structure; and

wherein said one or more shells delimit one or more through openings, in which the total area of opening of said through openings is less than 40% of the total area of the one or more shells including that of said through openings in which the slenderness of the entire connecting structure formed by said one or more shells, including the through openings, expressed as the ratio of thickness to circumferential extension of said entire connecting structure relative to the

axis of rotation of the brake disc is between $2/100$ and $4/100$.

27. (currently amended) A fixed caliper for a disc-brake comprising two side walls at a distance from each other which delimit a space suitable to accommodate a portion of a brake disc, in which one of said side walls comprises means for attaching the caliper to a vehicle so that said caliper is integral in rotation and in translation and the side walls are connected to each other by means of a connecting structure which straddles the disc space, in which each of said side walls delimits at least one seating capable of accommodating at least one pad and in which the caliper comprises thrust means capable of forcing the pads against the brake disc to clamp the pads, said thrust means being secured to said side walls in such a way that said side walls absorb the entire clamping force and said seatings being capable of securing the pads in such a way that the side walls also absorb the entire braking force applicable by the pads to the brake disc by friction, in which said connecting structure comprises one or more shells, arc-shaped or arranged along an arc, ~~connected so as to be~~ formed as a single integral structure having ~~with~~ both side walls along outer circumferential edges thereof, in which the slenderness of said one or more shells expressed as the ratio of thickness to circumferential extension of said one or more shells relative to an axis of rotation of the brake disc is less than $17/100$, wherein the radial thickness of all shells forming said connecting structure is constant along the entire circumferential extension of said connecting structure, and wherein said one or more shells circumferentially overlap the area of said seating for the pads.